



Grain

■ ELEVATOR OPERATION
AND MAINTENANCE

APRIL
1936

This first copy of
"GRAIN" is sent
to you with the
compliments of
Dean M. Clark.

Greetings and Salutations

"GRAIN," the new publication for terminal elevator managers and superintendents, raises its infant voice in greeting!

Perilous times, these, for a new-born babe to toddle forth into this somewhat hectic world, but, reflecting the buoyant spirit of those it hopes to serve, "GRAIN" joyfully and confidentially nevertheless DOES!

Its destiny in this scheme of affairs we call life is to bring to each the benefits of all.

If its pages give you a little knowledge, a little pleasure, and a quiet chuckle or two, "GRAIN" will feel its existence justified!

THIS NEW MAGAZINE

By "COLONEL CONDITIONS"

MOST of us who get up here to the position of Manager and Superintendent are likely to forget the fact that it was energy and NEW IDEAS that got us here. Now, don't think I'm preaching, for I'm not. I can imagine a lot of you guys (same as I'd be!) swelling up in haughty grandeur and saying, "Where does this bird get his stuff!"

Well, I'll tell you. I happen to like these young fellows who've been working so hard to get out this magazine and when they asked me to contribute a line or two, I just took an extra heavy drag at my cigar—and let go.

Here's my dope, and if you think I'm pulling the wrong bin, write me in care of the publisher and I'll challenge you to a duel of loading a vessel or shipping a hundred cars! (Time and cancellation reports to be the rules.) And I'll go to bat sooner than you can say "Bin burnt!"

Well, here's the stuff, fellows. To my way of thinking, the bozo who sits on his—well, I was going to say "tail" but I won't—the fellow who lays around all

the time instead of **doing** something, can't expect, naturally, to keep up with the parade. Now I know in my own case that when a new way of handling a certain grain comes into view, I like to try it out—just to see if it's better than what I've been doing. If a new method of elevator procedure pops up, I like to give it a whirl—just in case it will fit my own particular needs better. I'm not bragging, but I do believe in keeping an open mind. And the fact that I've been in this business since I lost a derby on Bryan's first effort, shows I'm not talking through the same hat.

We've got to keep up with the times, lads, and one of the finest ways I know of is to digest the contents of this magazine thoroughly. This may sound like a deliberate boost but it isn't, because I've been in the game long enough to know what it's all about, and seeing as how I've already read the proof-sheets, I know what I'm gabbing about. If we all absorb the information that's presented here, I'm sure we will be on the way to better things.

Editorial

by DEAN M. CLARK

IRREPLACEABLE LIFE

A NEWSPAPER headline, "10,000 Chinese Lost in Flood" — and we casually turn the page to see what our local baseball team is doing. ● Another day a fire breaks out in the industrial center of a distant city. It rates a headline. We hesitate a moment over it and glance at the particulars before seeing how the home team is faring. ● A news headline the next day tells of a grain elevator blowing up — **and the resultant details are all too meager for our interest.** In our absorption of this news item concerning our own industry, we forget entirely the standing of our local athletes. Because, after all, a man's paramount interest is his job, and when that job is affected even remotely, the fact that his home team is on top or in the gutter is of little importance. ● For the thing which strikes us deepest is that which is nearest. And what is nearer to a man than his life? ● A wrecked Elevator can be rebuilt. A burned mill can be replaced. But a lost life is irreplaceable. ● It follows, obviously, that we should take a greater interest in the prevention of conditions which may tend to bring about a loss of life in our plants. We should remember that what can happen in one plant can happen in another, and that only through an applied study of preventive effort can we eliminate the factors which lead to destruction of property, cessation of business — and the loss of irreplaceable life.

Grain

332 So. La Salle St.
CHICAGO, ILL.
Phone HARrison 2425

A forum for operative
and mechanical prob-
lems in terminal ele-
vators.

\$1 PER YEAR



DEAN M. CLARK - - Publisher
SANDY KEIR - - - - Editor
JOHN SCHULTHEIS - Staff Artist
KENDALL ONSTAD - Circulation
Manager

A LEADER

FOR LEADERS

LEADERS in the grain business prefer to have their elevator designing and building placed in the hands of the leading specialist in such matters. For that reason and because of past satisfactory performance, our clients repeatedly come back to us for new work.

CHOOSE

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ENGINEERS AND CONTRACTORS

IDENTIFIED WITH PROGRESSIVE ENGINEERING FOR 90 YEARS

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W. R. SINKS
President

H. G. ONSTAD
Vice Pres.-Gen'l Mgr.

Explosions

On a quiet afternoon Mr. Hylton R. Brown, the well known chemical engineer of the U. S. Department of Agriculture, gave vent to these concussions in an assembled meeting of the Society of Grain Elevator Superintendents:

●
Buffalo Elevator blows up — 2 killed — 14 hurt!

●
Cleveland Elevator plant, burning sawdust for boilers explodes, killing and injuring 4!

●
Wichita Falls house sustains large stock and property loss through an explosion during the noon hour which killed one man and seriously injured several more!

●
Amarillo reports a friction-caused explosion which injured four men.

●
Riverdale registers an explosion loss of \$300,000!

●
A St. Louis Elevator, always regarded as a model of cleanliness, killed seven men and injured eight in a disastrous explosion and fire which was fortunately checked by the guillotine-type doors between partitions. Other men working at the time in different parts of the plant were unhurt.

●
Chicago Soy Bean plant, killed 11 and injured 45 in an explosion.

* * *

LIKE the "G men" of fiction, Mr. Brown shot item after item at the assembled Superintendents and then, when they were sufficiently riddled, he brought forth the doctor's bag of suggested remedies and precautions.

He made this extremely interesting by introducing a miniature grain elevator, wherein he subjected samples of dust brought by the Superintendents, to an explosion test. His equipment was simple and yet adequate. It consisted of a chamber, over the top of which was a renewable paper cover, secured in place by a band. The dust was placed in a pan with an air jet which blew it across an electric coil. Air was

pumped into a small tank and then released suddenly to puff the dust into a cloud. The air pressure did not break the paper unless an explosion occurred. A glass window in the chamber allowed the observers to see the flame inside when the dust ignited. There was a considerable variation between tests of the various samples of dust in the sound of the report and the flame in the open air, *but it demonstrated graphically that a light spark will touch off grain dust providing the air mixture is right.*

He then pointed out that only 7/1000 ounce of dust per cubic foot of air will supply the proper mixture for an explosion. The conclusion he drew from this was to control the factors in handling grain which may cause this explosion-ripe union of air and dust.

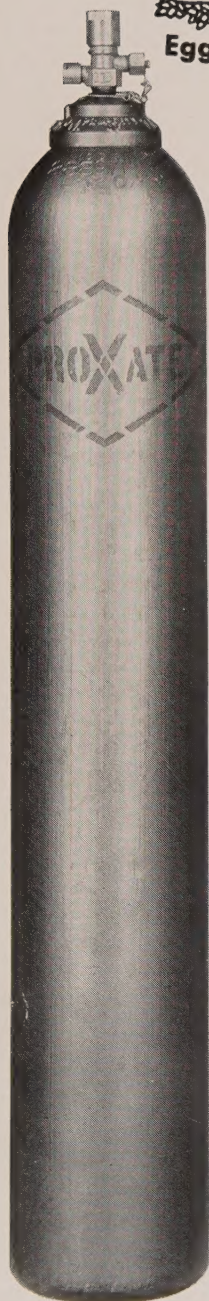
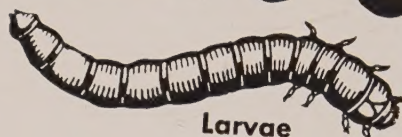
Mr. Brown explained that the proper venting of elevators reduces explosion loss. A dust explosion is cumulative — it starts off with a small puff and increasingly enlarges by series of greater explosions until its force rips out all of the confining area. It follows, then, that if a portion of the confining area is weak enough to give away at the impact of the first or second explosion, the force will be speedily dissipated. Such is the purpose of the vents. They not only carry off excess dust but afford a controlled pathway for the force if an explosion. Suction systems have their essential place in the elevator to help eliminate the dust but, according to Mr. Brown, they should not be used on the legs as they sometimes prove a fire hazard in this connection.

Fumigation, considered by some a cause of explosions, has never been proven guilty. Though spontaneous combustion has caused a lot of elevator fires lately, it has not been shown to be the *inciting* cause of explosions.

In conclusion, the task before the Elevator Superintendents is to co-operate with the scientific bodies in a mutual effort to reduce and eventually eliminate the disastrous hazard of explosions by keeping up with the latest information on the subject, and to maintain their plants in the safest possible manner.



Gets them all



Prevents Infestation In Stored Grain

Proxate has proved its value to the grain trade by protecting stored grain from the ravages of insect infestation. Proxate, when properly applied, destroys all insect life in stored grain in concrete, tile, brick or steel bins.

Proxate is not only an *effective* fumigant for grain — it's *safe*! No danger of fire, explosion or toxic effect on humans — no effect on grain germinating capacity. It leaves no odor, taint or residue.

Grain should be fumigated at the first sign of infestation. With the highly efficient methods for application developed by "Liquid" engineers, one treatment is sufficient to destroy all forms of insect life, even to the center of the grain.

The Proxate Handbook gives more detailed information. Write for a copy.

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BOOKLET

PROXATE



The Argentine Handles Grain too

NOW that the North American Superintendents are getting a taste of South American grain, it may be interesting to the fellows if I told of some of the things I saw down there during my 11 years stay below the equator.

Naturally, methods are different down there. Of course, things are changing right along and I don't suppose it will be long until our southern cousins adopt our methods up to the hilt, but right now the Land of the Gaucho follow practices in the grain business that sure seemed queer to me at first.



No Machinery Required

My eyes first popped at the system in operation at Rosario, a live town about 190 miles north of Buenos Aires. There the elevators are built on the high bluff forming the harbor and all they have to do to load a boat is to pull the grain from the bins *down* into the scales and then drop it 200 feet into the holds of the vessels!

When I left there in 1927, they were still unloading cars by machinery but I understood the powers that be were working on a plan to build the next house so that the grain could be dumped directly into the bins without all that effort.

The bulk handling of grain down there is still in what the experts call "a formative process." The majority of the farmers bring the grain to the elevators in bags. And it wasn't many years ago that the grain stayed in the bags until they were cut and dumped into the export vessels.



E. J. RAETHER

Superintendent
Belco Elevator,
Union Elevator Co.,
Minneapolis, Minn.

Supervision Unknown

A South American grain man would probably squirm at the necessary restrictions we enjoy. Down there, grain is stored with a mark to show the number of sacks. From then on the buyer is responsible. The fact that he had previously sent his men into the fields to purchase the grain according to the F. A. Q. — which means Fair Average Quality — doesn't release him from the obligation of paying his bill of lading before he receives the grain. And some times — oh, well, we are all practical enough to imagine what sometimes happens!



Nightmare Railroads

I often smile to myself when I see superintendents up here, myself included, raise hob with the yard manager of the railroad for sending over a few bad order empties. Down yonder in the land of the Latin Americas you never know what you are getting in the line of railroad equipment. In the first place, they have two gauges — the Russian, or wide, and the narrow gauge. And the mongrel bunch of cars! Some even have four doors. But in spite of all that, they were the first to use grain doors!

From what I hear, though, our South American sister is stepping right along and it wouldn't surprise me a little bit if she didn't make us hump to hang on to what few export markets we have left.

A MESSAGE

of Congratulations and Appreciation

● The Hart-Carter Company is proud to have a place in the first monthly issue of this new publication. As you know the Hart-Carter Company has been closely identified with the terminal elevator field for a great many years. A development of this kind, providing terminal elevator managers and superintendents with a monthly medium for carrying news and trade information, has our genuine interest and sincere good wishes for success. In expressing our congratulations, we wish also to carry to the members of the industry individually our appreciation for the generous patronage they have given us year after year.

THE LAST WORD in Terminal Equipment

● The Hart-Carter Company offers to Terminal Elevator operators the very latest in grain cleaning equipment. The machines now available, embodying all of the latest tested improvements developed by Hart-Carter engineers, are the last word in efficiency and low operating cost. *Remarkable results are now possible with Barley.* New efficiency has been brought to the processing of wheat and oats. Capacities have been increased to as high as 2200 bushels per hour. Find out about the latest Hart-Carter machines.

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FULL INFORMATION

HART-CARTER ACCEPTS the Responsibility of Leadership

The penalty of leadership in any field is the responsibility of maintaining continued leadership. Progress must never stop—each product must represent the ultimate in efficiency and value—there can never be a compromise with quality or performance. Hart-Carter accepts the responsibility which leadership imposes—it offers your industry all that such leadership implies.

● As evidence of its outstanding position in the grain cleaning industry consider these facts: Sales of Hart-Carter grain cleaning machines (not including agricultural equipment) in 1935 alone totaled nearly one million dollars; Hart-Carter products have led the field in sales every year not only in the United States, but in Canada, and throughout the world; more Hart-Carter grain cleaning equipment is in operation in the Grain and Allied Industries than all other makes of indented or pocketed cleaning equipment combined.

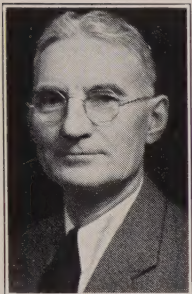
HART - CARTER COMPANY

Carter-Mayhew Division

706 19TH AVENUE, N. E.

MINNEAPOLIS, MINNESOTA

OUR Superintendents



HENRY P. W. KEIR

HENRY P. W. KEIR, superintendent of the Wabash Elevator and president of the Chicago chapter of the Society of Grain Elevator superintendents, hardly needs an introduction to most of us. We are all more or less acquainted with his driving energy and quiet good will. As a national director he instills an influence that has been felt and appreciated. In the local work he has brought a new high in productivity.

Henry first became acquainted with elevators back in 1889, when as a lad during school vacations, he coopered cars in the old Bartlett Frazier Co.'s Union Elevator in Joliet, Ill. The smell of dust never really left his nostrils after that although he worked in other fields.

When the depression (they called it "hard times" then) swooped down in the '90's, Henry, now a journeyman bricklayer, threw down his trowel and returned to the grain business. He worked in various houses until one hot morning in July, 1901, when he appeared at the Wabash Elevator in Chicago and was hired out as a shoveler.

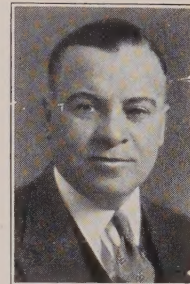
Here his all around experience and ability was not long wasted pulling a shovel rope and he soon ran the scale of jobs up to house foreman.

But a man who forges ahead from shoveling to the foreman's job will not be satisfied until he reaches the top and so, in 1921, the ex-shoveler was appointed superintendent. A genuine case if there ever was one of "through the mill!"

In 1927, Bartlett Frazier Co. took over the elevator—giving Henry the same employer of 38 years before but not the same job. The years had swallowed up the youthful car-cooperer and had returned a mature superintendent.

As a practical superintendent, Henry Keir is acknowledged in the highest class. A man whose information keeps him keenly alive to the best possible methods of grading and handling grain and whose host of friends bear ample witness of his character.

OSCAR W. OLSEN, superintendent of the Peavey Elevator, Duluth, and national president of the Society of Grain Elevator Superintendents, is just a youngster of 45 years—but 30 of those years have been spent in the grain business. This qualifies Oscar as one of our youngest veterans—and qualifies the Society as an institution which recognizes talent.



OSCAR W. OLSEN

Since President Olsen has been doing the "mixing" for the Society, the "cancellation sheets" are tops. His system of injecting fresh ideas and new methods into the fraternity has won him the acclaim his business associates have already accorded him.

Oscar started his career in 1906 as a messenger boy for the Peavey Duluth Terminal Company. He soon figured that running messages only got him from desk to desk while running up and down a bin floor would teach him the grain business. So Oscar jumped into the place where the hiss of moving grain taught him the fundamentals of elevator operation.

He ate dust on various jobs in the elevator until the World War called him to the Aviation Corps of the United States Army, and high over the training field at Fort Worth, Texas, he finally sniffed dust-free air. It couldn't have suited him, however, for upon signing of the Armistice, Oscar took over "the controls" of Peavey's Globe Elevator.

In 1923, he moved in as superintendent at the Peavey Elevator in Duluth, and has shown in the intervening years just what a progressive superintendent can do. Among the things he modestly tries to hide are two silver cups—prizes awarded by the Duluth Chamber of Commerce in 1928 and 1934 to the plant maintaining the highest standard of safety.

Thirty years in the business with the one firm is recommendation in itself, but Oscar's record in the business stands even higher. He is generally recognized as the leader in promulgating new standards of efficiency in grain elevator operation, and his position as president of the Society proclaims his nature.

It Costs Money TO BE WITHOUT
"ZELENY PROTECTION"

You Want SAFE GRAIN STORAGE at the
LOWEST COST!

You Want TO KNOW THE CONDITION OF
YOUR GRAIN AT ALL TIMES!

You Can Know This by equipping your bins with the

**ZELENY
THERMOMETER
SYSTEM**

which is now installed in more than

11,000 Bins

protecting over

200,000,000 Bushels of Grain

**CAN YOU AFFORD TO BE WITHOUT
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WRITE TODAY for the cost of the
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There is no obligation.

ZELENY THERMOMETER CO.

542 S. Dearborn St.

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The ZELENY SYSTEM lasts a lifetime, with little or no upkeep, and pays for itself over and over again —

By telling you the temperature of your grain at ALL times,

By preventing bin-burned grain,

By telling you WHEN you should turn your grain,

By eliminating needless turnings involving a loss of about a bushel of grain for every thousand bushels you turn plus the labor and power cost of turning.

THINK THIS OVER!

Here's the Dope

NEW "high peaks" (with no reference to power bills) are expected to be established by the Superintendents' Society at their seventh annual convention, just announced for June 12-15. Both in program and anticipated attendance will this gathering top all past records.

Duluth will be the camping grounds for June 12-13, the delegation going to Minneapolis for their annual banquet Saturday night (13th) and for the two following days of inspections, addresses by leaders, and discussions.



OLSEN-CHAMPLIN HEAD DULUTH-MINNEAPOLIS CONVENTION COMMITTEES



VICTOR CHAMPLIN

PEAVEY'S Oscar Olsen, versatile president of the Superintendents' Society, is steering Duluth's Convention Committee, with the able assistance of Occident's Manager, the popular Jack MacInnis.

Archer-Daniels' "Vic" Champlin tops the Minneapolis committee with the capable aid of Cargill's Frank Neilson and Jim Hayhoe, et al. Dwight Bell is Convention Committee Secretary, and "Nick" Carter, Chairman of Associates' Night, promises a festive entertainment affair full of surprises.

The extensive plans and novel arrangements being made are sure to warrant the same response as some of the merchandising offers heard over the radio, viz., double your money back if not entirely satisfied.

All those attending conventions in the past have returned to their respective cities well repaid for their time and expense, and this year the committee is going to outdo all previous efforts. Attending is a sure-fire investment.

VALUABLE INVENTION TO BE DIVULGED AT CONVENTION

CARGILL'S Frank Neilson has a valuable idea which he is going to divulge to those attending the annual convention of the Superintendents' Society in June.

He's tried it out in his plants, finds it works to perfection, and while patentable he's going to give it to the attending membership with his compliments.

Any superintendent can make and apply his excellent idea at very little cost, effecting great savings.

Best of all are the advantages accruing from use of his device, which in addition to lowering maintenance costs is an answer to many an owners' and operator's fears and worries.

"It's simply too big and too valuable a proposition for any one person or firm to have alone," he says, "and so good that I take pleasure in passing it on to the membership at the time of our annual convention in June."

Hats off to Frank Neilson!



FRANK L. NEILSON



NOVEL CHICKEN & BEAN DINNER TO PEP UP NEW MEMBERSHIP DRIVE

IMAGINE the chagrin of sitting down to a dinner of beans when your luckier opponents are lustily devouring chicken at your expense?

That's the plan for the April-May membership drive, the details of which just leaked out from headquarters.

Two teams, listed below, will vie with one another for the victory of the most new superintendent members, the winners to be feted at the annual convention

THE NEW BENJAMIN DUST-TIGHT GRAIN BIN PORTABLE INSPECTION FIXTURE

The new Benjamin Dust-Tight Portable has been particularly designed for the safe and effective lighting of the interiors of grain storage bins. It fills a long felt need of grain elevator operators, owners and insurance underwriters, for a portable inspection unit which can be lowered directly into the grain bins for inspecting grain levels and as an aid in servicing; without the danger of igniting the combustible grain dust present inside the bins.

This Inspection Portable can also be used to light bin interiors, by directing the beam of the unit through one of the man hole openings in the top of the bin. With the unit held at the top of an average bin, and the bottom edge on a line parallel with the bottom of the bin, there will be plenty of light at the bottom of the bin, with adequate light for inspection of the side-walls.

LISTED BY UNDERWRITERS' LABORATORIES

Listed by the Underwriters' Laboratories as an approved dust-tight portable for Class II, Group G, locations, as defined in the 1935 National Electrical Code.

HENRY S. COX



Mr. Henry S. Cox, Superintendent of the Rialto Elevator, of the Star Grain Co., Chicago (Unit of Washburn-Crosby Co.), first stressed the vital need for a special grain bin inspection portable, and it is as the result of his many valuable suggestions that this new fixture has finally been developed. Mr. Cox says:

"I am glad to have had the opportunity of assisting in the development of this unit, for

which all grain elevator superintendents have had a long felt need. I am sure that every superintendent will be glad to know that we now have a safe, approved lighting fixture for grain bin inspection."

This new unit will be available on or after April 21, 1936. Write for bulletin A. D. 3794 giving complete description, list prices and other data.

BENJAMIN

TRADE MARK



Catalog Number 5695

FEATURES

DUST TIGHT CONSTRUCTION—The lamp is entirely enclosed; the body is dust-tight while a gasketed cover glass seals bottom of unit. Cable enters hood through dust-tight bushing.

STREAMLINED DESIGN—There are no pockets for dust accumulation and special insulation between inner and outer housing prevents dust ignition from heat generated by the lamp.

TAKES STANDARD CABLE—Can be easily wired, using standard No. 16 gauge, type S, three conductor rubber covered cable.

NON-FERROUS METAL GUARD—Combination guard and stand for portable is of non-ferrous metal to prevent sparking.

LIGHT WEIGHT—Light in weight but sturdily constructed of most suitable materials to with-stand rough treatment.

EASILY HANDLED—Spade type handle allows unit to be easily moved from place to place; also provides convenient method of attaching rope for lowering into bin.

BENJAMIN ELECTRIC MFG. COMPANY

GENERAL OFFICES
DES PLAINES, ILLINOIS

NEW YORK
230-234 West 17th Street

CHICAGO
20 North Wacker Drive

Here's the Dope

(CONTINUED FROM PAGE 11)

by the bean-eating losers. Fun, conviviality and the spirit of rivalry will be worth the price of admission alone.

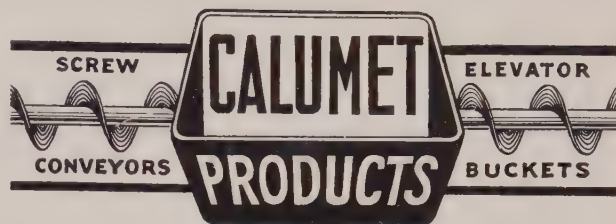
Anyone else wishing to join either team is eligible, says President Olsen, just so both are evenly divided.

The starter's pistol will be fired April 1! The race will be on! Visualize the expressions of satisfaction of the winners. Oh, my!

The "Step-an-fetchit" Team is: Peavey's Oscar Olsen, Duluth, Chairman; Star Grain's Henry Cox, Chicago; Archer-Daniels' "Vic" Champlin, and Cargill's Frank Neilson, Minneapolis; Western Maryland Ry's. Bill Feemster, Baltimore; Grand Trunk Pacific's Frank Beyer, Fort William; Bartlett-Frazier's Henry Keir, Chicago; Crowell's Arvid Anderson, Omaha; Galveston Wharf's Henry Johnson, Galveston; Farmers National's Joe Wilke, Peoria; Albert Dickinson's Frank Smith, Chicago; Union Elevator's Ed Raether, Minneapolis; Norris Grain's Fred Hawley, Chicago; Flanley Grain's Herbert Gear, Sioux City; Arcady Farm Milling's Gilbert Lane, Riverdale; B. A. Eckhart Milling's Ernest Peterson, Chicago; Capitol Elevator's Hollis Graves, Duluth; Pratt Food's Louis Rendell, Hammond; Hales & Hunter's Jim Auld, Chicago and Spencer Kellogg's Maurice Cobb, Minneapolis.

The "Dark-Horse" Team is: Toronto Elevator's James Mackenzie, Toronto, chairman; Rosenbaum Bros.' Bill Gassler, Chicago; Cargill's Jim Hayhoe, Minneapolis; Spencer Kellogg's Godfrey Morgan, Buffalo; Terminal Grain's H. L. Heinrichson, Sioux City; Staley's Harold Wilber, Decatur; Occident's James MacInnis, Duluth; Stratton Grain's Harry Thoms, Milwaukee; Farmers National's Elmer Karp, Chicago; Continental Grain's W. A. Randall, Vancouver, Wash.; Wichita Mill & Elevator's J. N. Catter, Wichita Falls, Tex.; Hales & Hunter's Bernie Kline, Riverdale; Twin City Trading's Maynard Losie, Minneapolis; Washburn Crosby's John Hall, Chicago; Turner-Hudnut's Frank Byrnes, Pekin; Nebraska-Iowa's W. S. Pool, Jr., Omaha; Union Elevator's Jack Coughlin, Minneapolis; Bartlett-Frazier's Jim Cox, Chicago; Bartlett-Frazier's Gus Baade, Burlington, Ia.; and Corn Product Refining's Wm. Schaediger, Edgewater, N. J.

Those members on each team who do not turn in any new applications, will have to eat standing up, 'tis said.



CALUMET IMPROVED SCREW CONVEYOR AND SCREW CONVEYOR FITTINGS

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ELEVATOR BUCKETS

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HEAVY "V"
RIALTO
BUFFALO
STEEL EAR CORN

STONE AND ORE
TIN MILL
STEEL GRAIN
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MALLEABLE IRON

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ELEVATOR	•	BUCKET	•	BOLTS
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BUTTON	•	SQUARE	•	HEAD

• •

GENERAL SHEET METAL WORK
FOR ELEVATING AND CONVEYING
GRAIN • CEREAL • FEED
COAL • CEMENT • ORE
AND COTTON GIN PRODUCTS

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REDLER

CONVEYORS -- ELEVATORS

Handle wheat, shelled corn and similar grains — conveying horizontally, vertically, up inclines or around curves — in the same conveyor unit. The grain is caused to flow in a solid, undisturbed column through an enclosed steel casing. Fire Prevention Engineers report that Redlers are:

1. Dustless in operation.
2. Long wearing, handle gently and do not break grain.
3. Self-feeding and non-chokable.
4. Can be discharged at any point by opening a slide gate.
5. Save power by eliminating unnecessary handling.
6. Adaptable to wide variety of installations.
7. Save on installation cost and operation.

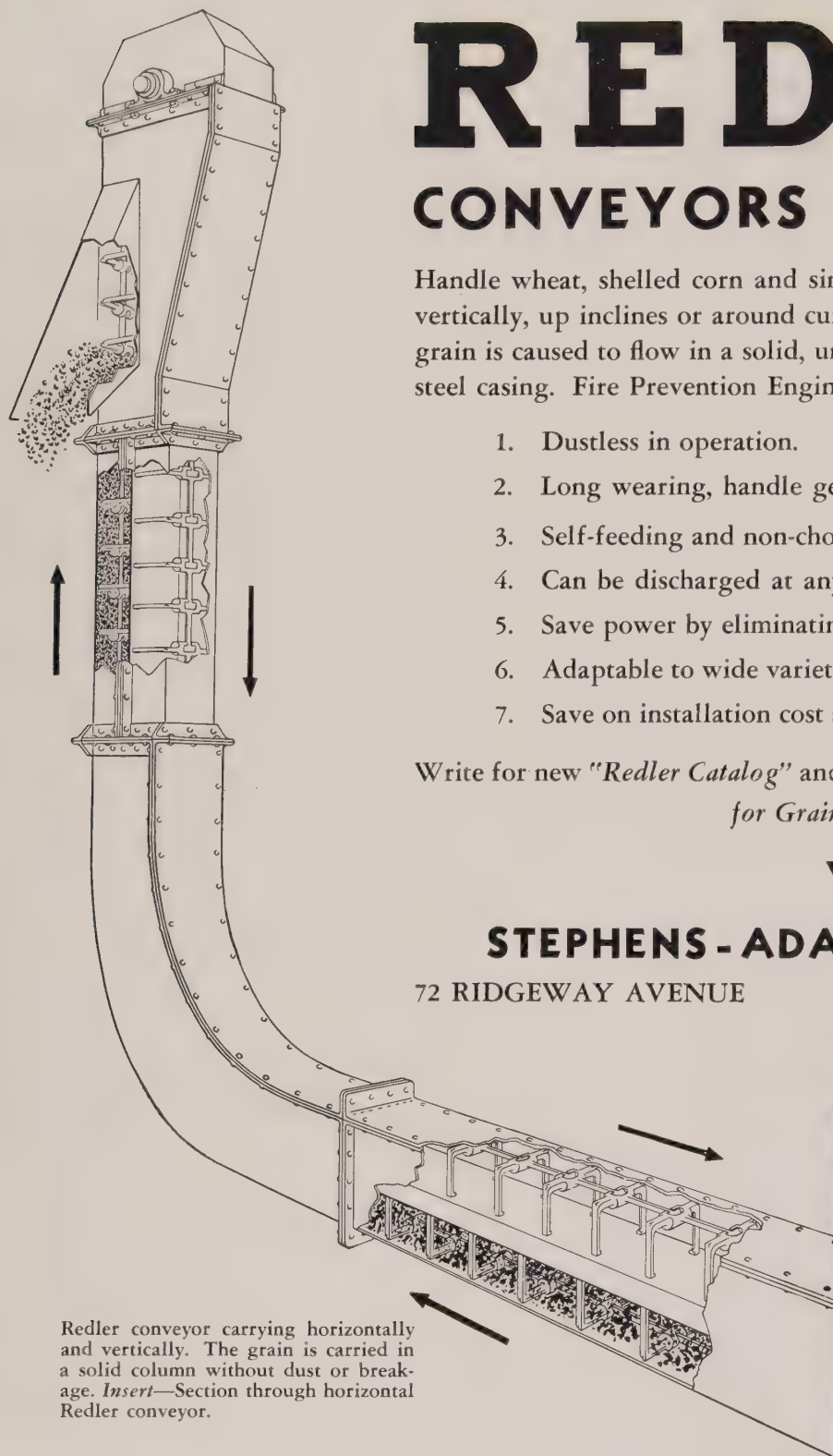
Write for new "Redler Catalog" and bulletin describing "Redler Conveyors for Grain Elevators."



STEPHENS-ADAMSON MFG. CO.

72 RIDGEWAY AVENUE

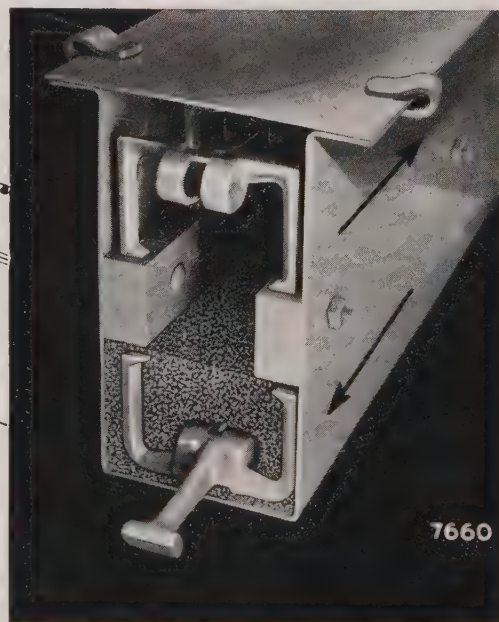
AURORA, ILLINOIS



Redler conveyor carrying horizontally and vertically. The grain is carried in a solid column without dust or breakage. *Insert*—Section through horizontal Redler conveyor.

Write for prices on S-A equipment for handling grains.

Belt Conveyors	Bucket Elevators	Screw Conveyors
Carriers	Boots	Spouts, Chutes
Pulleys	Buckets	Turn-heads
Take-Ups	Belting	Hoppers
Redler Conveyors	Power Shovels	Redler Conveyors



Theory and Practice



IN THE *Drying* OF GRAIN

HAROLD C. WILBER, Superintendent

A. E. Staley Manufacturing Co., Decatur, Ill.

IN THE process of drying grain, that part of the moisture within the berry in which we are interested is the free moisture or that part of it which we may induce to leave the grain by changing the characteristics of the air which surrounds it. If a parcel of grain of known factors is exposed to air of known physical conditions, the two will come to an equilibrium moisture after a period of time. Damp ear corn stored in the crib during the cold and comparatively wet winter months loses a small amount of moisture to the air. When spring comes with its warmer and dryer air, the moisture in the corn tends to leave and go to the air. This process goes on at an increasing rate into the summer until an equilibrium of moisture is established. If this same lot of grain is left remaining in the crib until the cool wet days of autumn, the moisture in the grain rises and strives to establish a new level on account of the different surrounding conditions.

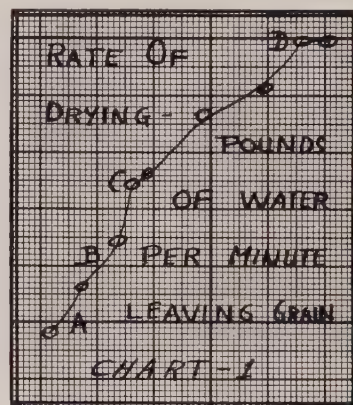
The modern grain drier takes moisture from the grain by exposing it to artificial conditions in which the air is warm, of a relatively low humidity and in the moving state.

The principal factors which govern the process of drying by exposure to air are temperature, time, humidity and velocity or volume. High temperatures increase the rate of evaporation. The moisture within the berry must leave as vapor through a thin air film on the surface of the berry. The driving force of this reaction is the difference of the humidity in the surface film of air around the berry and the humidity of the air stream. The velocity factor has the effect of removing the wetter film of air and replacing it with drier air as a washing action. Within definite limits which we shall mention later, the extent of the drying reaction depends upon the time during which the grain is exposed.

The time element is shown by the horizontal scale, and the pounds of water per minute which leave the grain are shown by the vertical scale. As the grain is first exposed to the drying air, the rate starts at zero at the point "A." At this point the grain is cool. The action starts slowly and increases rapidly as the grain is warmed. At the point "B" the warm grain is rapidly

giving its surface water in the form of vapor to the moving air. At this stage the drying process is practically an evaporation process. The moisture is taken away just as it would be taken from a drop of water. Every pound of water that is being evaporated is absorbing about 970 B T U of heat and consequently the temperature of the grain does not rise very rapidly. During this part of the process high temperatures would be efficient but since the grain is still heating, they are not attained. As we near the point "C," the brush and tips of the grain lose their surface moisture and this condition soon spreads to the whole surface of the berry.

When the point "C" is reached we have a dry surface and to some extent a hard shell but a comparatively wet and soft interior within the berry. At this point a diffusion process sets in and the rate of drying changes sharply. The moisture content of the particles under the skin coat strive to equalize them-



If we place a unit of grain of known factors in a batch drier and expose it to drying air of known temperature, relative humidity and velocity, and measure the relative humidity of the exhausted drying air by means of a hygrometer of the wet and dry bulb type, we are able to measure the pounds of water per minute leaving the grain and therefore the drying rate.

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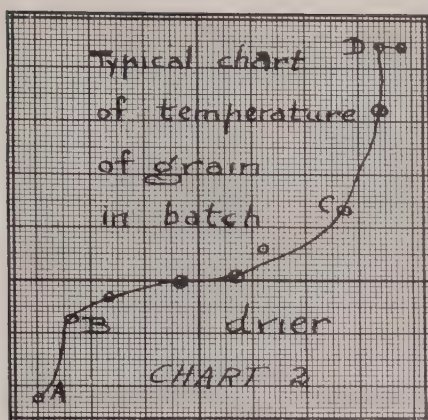
selves. The moisture of the inner particles diffuses to those in the dryer shell. The rate of drying is lowered and takes the path of a rather straight line to the point "D" on the chart. It is during this part of the process that many mistakes are made which waste fuel and which injure the berry. At a fixed temperature, the internal moisture will diffuse towards the surface at only a definite rate. The surface evaporation goes on only at the rate at which the moisture diffuses to the surface and consequently the temperature of the grain rises, since the lower evaporation rate does not absorb so much heat. Abnormally dry air or excessive quantities of it during this process are only waste since the rate of diffusion to the surface is limited.

It is during this part of the process that checking and casehardening take place. The outer layer of the berry is by this time a rather hard shell. The inner part is still rather damp, consequently if this harder shell shrinks, which in most grain it tends to do, the outside of the berry will check and crack, exposing the inner portion which nature had fitted with a good coat.

The diffusion process may increase somewhat with increased heat but at too high a rate the internal structure and makeup of the berry may be altered which will show up later in weight per bushel test, refining of the oil, or in baking tests. "D" on the chart designates the point at which the diffusion has been completed and at which the grain is at an equilibrium moisture content with the air. Beyond this point the temperature of the grain goes directly to the air temperature and the drying rate is nil. Consideration of this chart makes it easy to understand that within limits of getting the necessary work done and the slower the drying process, the more efficient it becomes and the more kindness it shows to the grain.

If we expose a batch of grain to fixed drying conditions and watch the temperature of the grain as the process goes on, a rather typical chart of the grain temperature is as follows:

The cold grain enters at the point "A" and is heated rather rapidly up to the point "B." At this stage the evaporation of surface moisture becomes marked and the absorption of heat has the effect of holding the grain temperature below the temperature of the drying air. At the point where the green grain enters the drier, if the relative humidity of the drying air is very high, the temperature of the grain may be below the dew point of the air and some condensation may result on the surface of the berry. This is particularly true in cases in which the drying air is



It is very good practice to check the temperature of the drying grain at the point of maximum temperature in the drier. The higher the initial moisture of the grain being dried and the smaller the amount of moisture that we remove, the greater the difference between the maximum temperature of the grain and that of the drying air. After all, our drying temperature is that temperature which the grain actually reaches and not that of the drying air. The heat absorbed in the evaporation process makes for quite a spread in certain types of drying. A careful study of our particular machine may show us that with some types of drying of comparatively wet grain we may run the temperature of the drying air quite high without actually heating the grain to a very high temperature and thereby raise the efficiency of our drying. On the other hand this study may show us that in the drying of comparatively dry grain or in removing considerable moisture, we may heat the grain to a temperature that may possibly be detrimental to our product by casehardening, objectionable odor or otherwise.

or injury to the chemical content of the berry may result if this temperature is high.

In general the efficiency of the grain drier may be approximated by checking the relative humidity of the exhausted drying air. This may be done by a simple hygrometer consisting of a wet and a dry thermometer. It is very easy to wet the wick of the wet bulb and to place the instrument in the air stream just long enough for both readings to come to rest. The readings are noted and by means of a humidity chart or by humidity tables, the relative humidity of the exhausted air is found. Theoretically the relative humidity at the point of exhaust should be close to the dew point which also may be found from the same chart or tables using the readings of the wet and dry bulbs. For practical purposes a humidity of from 75 to 85 per cent is considered pretty good. If much below this point it would indicate that fuel or heat is being wasted to the outside air.

passed through a very thick mass of grain or several different passes before being exhausted. Between the points "B" and "C" the drying process proceeds normally. The surface evaporation of the smaller and rougher berries is finished first and this condition then spreads to the larger and plumper berries. The temperature of the grain as a whole rises slowly and evenly. As the diffusion process ends, the temperature of the grain goes to the temperature of the drying air at point "D" and scorching

Higher humidities of exhausted heating air may be accomplished by different methods, depending on the faults of the operator or of the machine. First, temperature and velocity of the drying air should be considered. It may be found practical to lower either or both. It may be done in the design of the machine by forcing the drying air through a sufficiently thick layer of grain or through passes in series. Recirculating the air from the cooler exhaust or a part of it by means of dampers and ducts is done in some installations. An arrangement of this sort may be both an economy and a benefit to the product.

In some machines as much as 30 to 40 per cent of the heat used is carried away by the cooler exhaust.

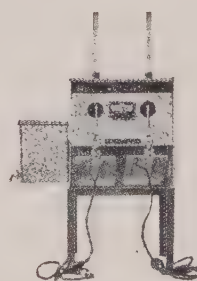
After the installation is in service, the operator must take the design as it is but at the same time if he will make an intelligent study of his particular machine, he should be able to adjust the four factors of temperature, time, humidity and velocity in such a way that the quality of the product will be something of which he will be proud and at the same time do the job with the minimum waste of power and fuel.



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Dust-laden air crackling in a sweep of fire . . . belt rushing by over his head . . . an unconscious man by his side . . . Danny, crawling forward inch by inch, fighting for the life of the man who had scoffed at him . . .

Dust

by KIMBALL HERRICK

IN
TWO
PARTS



IN a hot July the miserable town of South Ewing was boiling with dust and smoke, boats and cars. Its tumbled landscape, bruised with steel mills and coal docks, scarred with long, puckered slag dumps, and leprous with giant grain elevators along the black river, was full of busy noise and motion, full of strong, blue-shirted men, and full of hard, obvious accomplishments.

Flat-waisted Great Lakes freight boats fairly covered the dust-coated surface of the water, waiting to slide open hatches under thick, pouring spouts of grain. Long snakes of boxcars curled off the main lines into elevator yards, hastening to free the sliding, rippling tons of grain within them.

Dust clouds billowed out of track doors and dust plumes floated free from docks. Yellow-gray wheat dust, a fine and gentle dust, a dust that is delightful to behold, but which, as any fool of a dust breather in the elevators of South Ewing can tell you, is full of rich, satanic acid.

This particular dust billowed in a freedom that was its own in this particular July, for the month with which we deal was a while back, before the drought and the AAA. It was in a year when the wide, horizonless fields of Kansas still swelled up to spill hard wheat across the world. It was a year when the wheat river was in its stride and flowed gigantically up across the rolling prairies and into the crusty industrial town of South Ewing, and thence up the Lakes in fleets of sluggish freighters, and out across the sea.

ALSO, it was a year when Danny Morran, nineteen, big-eared, freckled, with jointy limbs that undoubtedly were held to his big, bony torso by no more than careless cotter pins, was trying to be a grain elevator man.

It was not a good year to learn to be an elevator man, this year of big crops and a howl for bread that sounded across the ocean in a polyglot European chant. And of all the dusty months of this year it was a very poor July in which to learn to be an elevator man — or was it? Perhaps, after all, there was some merit to this month, because, instead of the usual eight- or ten-hour initiation each day, Danny was putting in a good, solid twenty-four hours.

Then, too, in an ordinary year Danny Morran, who needed a man's job and a man's pay, might not have had the chance to break into the select company of good Polack shovel men, sweepers, oilers, car coopers, weighmen, and spoutmen. For the common requisites were a thick and hairy neck, a bulge of back muscles that would have given a grizzly pause.

But, with all his intensive education, Danny Morran was being pointedly informed that he would never make an elevator man. Joe Bolesy told him so each day as often as he thought of it, which was frequent, indeed, in the hard schooling that Joe Bolesy gave. "Potepiac!" Joe swore, and sometimes, in a milder humor, "Psiakrew! You clumsy poppy! If it was not so busy time joost now wit dis alleyvater, I vould myself take you oppstairs in de coopolo and drop you down a empty bin, you bet it. Nefer will you be alleyvater man like me."

LUCKILY, Superintendent Mike Willits, boss of the North Central A house, did not express the same opinion of the earnest, gangling youth as did Shoveler Joe Bolesy. Mike Willits needed men, and more men — because even South Ewing dust breathers of the first water do not find it easy to work the clock around on a turbulent, noisy working floor where pillars and spouts and elevator legs are almost hidden in a constant haze of dust.

He had Danny, and he was going to keep him. It looked almost as if he were going to keep him unceasingly imbedded in the dusty welter of the North Central's floor, for Danny had been home only once in sixty hours.

The six hours of that one relief had been a paradise of delicious, sodden sleep. Barely had he time to whisper, "Mom, we're makin' plenty of double-time money. I'm getting paid all the time I'm home, even, Mom," before he was fast asleep. And Mother Morran, blessing seven saints that her beloved departed husband, Pat, had left such a son to look after herself and two littler Morrans, washed Danny's face as he slept, tenderly soaking the black crust from his wide young mouth and the black corners from his reddened eyes, and saw him already a man.

Now another span of hours had gone by, and the North Central, vibrating, rumbling, groaning, had swallowed another lusty batch of railroad rolling stock, drawing in the red boxes in two parallel lines through the high front door, disemboweling them with the rhythmic sweep of the ceaseless shovels, and spewing them out onto the dead tracks behind, where the yard engine might swing around and catch them to be hauled away.

And now also another respite was due Danny Morran. Mike Willits, haggard and red-eyed from his own unceasing combat with a boiling house, a tough railroad crew, ship captains, a vigilant state grain inspector, and a critical corps of insurance people, had patted him on the back with a heavy hand and said, "You're a good boy, Danny Morran. In another few days the edge will be off this run and maybe we can be human beings again."

Joe Bolesy saw the friendly gesture and grinned behind Danny's back. Joe Bolesy was also off for a few hours' sleep, and like a pursuing devil he lumbered down the cinder path alongside the younger man, his short, powerful body throwing Danny's raw-boned length into beanpole relief.

"Some day mebbe, you work hard, you make leetle bit alleyvater man," Joe growled out at his constant buffer, "but yet now you was good for notting."

Danny turned upon his tormentor. There was fury in his eyes, and yet his freckled face disclosed not so much anger at this squat man as anxiety and fear, because Joe gave voice to what he wondered himself. Yet Mike Willits, that grand boss, had patted him on the back and said that he was a good man. No, he hadn't. Danny stopped short. Mike had said, "Good boy, Danny." That might mean anything, might be merely pity. In anguish Danny looked back at the giant black-walled house behind him.

That was how he came to see it, that monstrous thing that shook South Ewing. Beyond the dusty bulk of the North Central, across the river and perhaps a quarter-mile down, was the Arlington house, another grain elevator much like the North Central. The Arlington was a big house for those days, and in its smooth concrete it packed 2,000,000 bushels of 60 pounds apiece, a good many thousand tons of grain.

It was a big house, all right, and, as unhappy Danny Morran looked back and held it in the corner of his eye, the fading sun was bathing it in an orange glint and it appeared fine and grand. . . . But no fading sun made that dangerous reddish flash which suddenly puffed out a tiny window at the very bottom.

DANNY MORRAN'S frightened hands clenched convulsively. Something was coming that would not go out of his eyes so long as he might live. And it came quickly; first, with a practice pop that wheeled the squat Joe on his thick boot heels and turned his dark face white. Then, with no more than a long breath, there was a clap of thunder that put a thousand paltry summer storms to shame — and the great Arlington house exploded like a toy firecracker.

Before the great noise and the rushing blast of air spilled them over backwards, the two North Central men saw bin walls of solid concrete shatter like paper and throw huge chunks of many tons high into the air. A brilliant sheet of flame struck once against the sky, and instantly gave way to a cone of smoke and dust, grain and concrete. And in all the mad, fantastic spray that belched from the riverbank Danny saw one black thing, whirling end over end, and it was a man. Then the furied rush of air was upon them, and they went down as if an impatient genie had abruptly laid them in a bed of cinders.

There was no great harm in that. The harm was in Danny Morran's young eyes before he ever hit the ground. For once Joe Bolesy was silent. Grimly he stared at the place where an elevator had stood. A

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grinning skeleton of steel stood guard over the smoking mess below. The high skeleton winked in ghastly humor with the black eye of one great steel scale, a hopper holding at one draft some 80,000 pounds, hanging awry in what had been the cupola. Tumbled red boxcars lay at the foot of a devil's pile of gleaming yellow grain, and the last few geysers stuck their tongues up from the river's surface.

"Bog!" breathed Joe Bolesy, and Danny Morran shivered.

Dust explosion! South Ewing had no need to ask. Whistles screeched, and wives ran sobbing down the street.

Dust explosion. The wicked thorn that follows grain around the world. Dust explosion. The inexplicable wraith that hovers eternally in the fine mist above moving grain, until just that proper potion of air and dust is born. Then it waits slyly for the flick of a heel on a bit of metal, the casual bump of a high-speed leg bucket against a steel plate, the smoldering wickedness of a clot of waste from a bearing running hot, to furnish the simple spark to set off its terrific blast.

In five hours Mother Morran never stirred from the side of Danny Morran as he slept his wretched sleep. And never a word she said as he shook the slumber from himself and with scared eyes trudged across the avenue and back to work.

The North Central stood, a black chunk against the night, spitting dust from her arched doors and from her flood-lighted dock, where the hungry belly of another boat drank from the bleeding spouts at her side.

Deep beyond the fatigue in the superintendent's eyes a little of their kindness still lay, and as they looked at Danny Morran's face, Mike Willits said, "It was a bad blow-up over at Arlington, son, and if you want to take a little time off I guess we can get along. In a day or two now—"

Danny's glance shifted once to the sea of cars that weaved across the North Central's yard, and he looked back into the boss's face.

"No," he said. "I got to learn to be an elevator man."

THERE was a difference on the roaring floor of the North Central this night. Big men were given to long silences and suddenly to curious, animated chatter. And then the fragile burst of talk would die away. For the boom of the dust explosion across the river still echoed in the cavernous interior of the big house.

But not alone was this the thing that struck an uneasy quiver into many a thick chest. There was also the newly born awareness that what happens in one grain house can happen in another. The Arlington had been busy. And so was the North Central. The Arlington had been full of dust. And the North Central was hazy with the floating, explosion-laden gray stuff.

Knowledge that rests always latent in the elevator man came suddenly to the surface. They knew that the North Central's bearings were running hot, that the North Central's high-speed lifting buckets occa-

sionally kicked against the side of their sheathings as they fled up and down on their endless belts, and that men were kicking their nail-studded heels here as well as at other grain elevators.

But Danny Morran brought them a measure of relief. He was more frightened than they, his mobile mouth and wide eyes more revealing than theirs. And stalwarts who were given that night to sudden bursts of inconsequential talk, sudden orgies of harsh cursing, relieved themselves by the simple process of adding to the young one's fright.

"Sefen men vas killed," they whispered to him. "One man vas blow a hondred yards and land on top dot boat down dere—smash."

"Dey say is mebbe still more men underneat', under dot pile of stuff."

But Joe Bolesy was not among these. With grand disdain he swept the thought of dust explosions from his mind and carried on his bitter tutelage of Danny Morran. "You big foot!" he roared. "You clumpsy! Watch me do dis. Now I show you how alleyvater man should do."

THE dark hours rolled by, and into their black vacancy the North Central whispered her troubles, her great walls vibrating faintly with the pulse of grain running through her veins. A firefly pattern played about her switchyard as railroad men shunted their charges back and forth.

The ever-present dust floated through her open spaces, and Danny Morran sweated steadily against the unending work and numbly wondered how it felt to be drifting through the air like a thrown stick or trapped beneath a hundred million pounds.

The scratchy flick of a bristling fiber broom spelled emptiness for another hollow boxcar, and two car partners clambered down across the iron rungs of a platform and gained the floor, a squat man and a tall, loose-jointed youth with freckles and apprehensive young eyes. They were finished with their car before the next two were, for was not Joe Bolesy the best shoveler on the river? An idle moment thrust itself pleasantly upon them before the empties might be kicked out into the hole track and fresh, fat cars spotted.

The bleary-eyed foreman noted them, and said, "Joe, run down that alley and see if everything is all right. I've got the belt shut off for a few minutes. The oilers are tired, God help them, and I know what it is to forget."

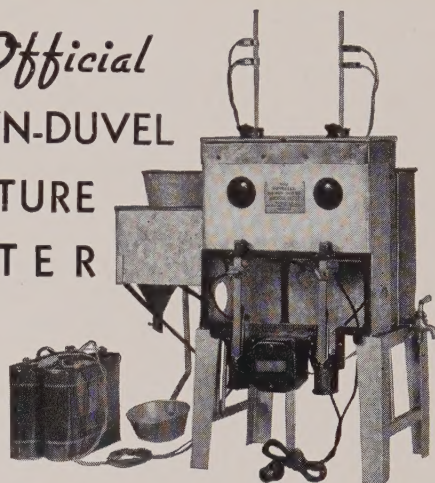
Joe Bolesy moved promptly. Perhaps somebody had forgotten at the Arlington that afternoon. It does not pay to forget in an elevator running grain. Joe Bolesy lumbered off to where the alleyway cut a tunnel down the length of the house.

Outside, in the dark shadow of the giant granary, Danny Morran found a water tap, and soaked his dusty head. The splashing water rushed down and mingled with sudden tears upon his cheeks. The splashing water endured beyond the running of his tears, and it was a steady face he carried back upon the working floor.

(TO BE CONTINUED IN MAY ISSUE)

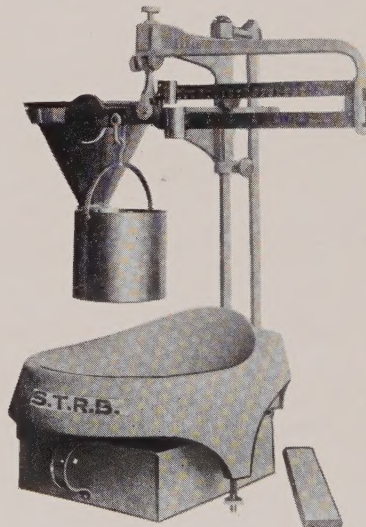
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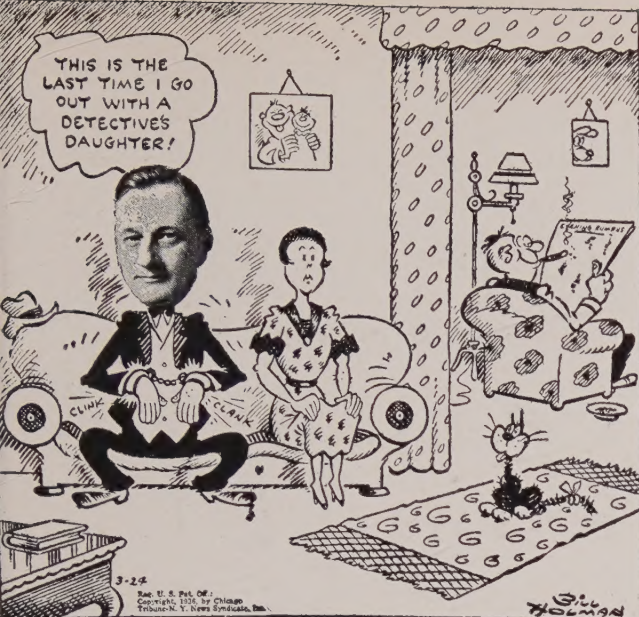
Chicago, Ill.

A Good Trimming Promised



[Apologies to Chicago Daily News]

Spencer Kellogg's Godfrey Morgan (Buffalo)
to Peavey's Oscar Olsen (Duluth): "Let's make
a path to the Duluth Convention!"



[Apologies to Chicago Tribune]

Cargill's Jim Hayhoe Pulls the Wrong Bin

★ ★ ★

Willie the Weevil's Lament

My uncle he sat by the spraver
And by the sprayer he died,
And at the coroner's inquest
'Twas called "Insecticide!"

★ ★ ★

Sad But True

A well known man once brought a friend home to dinner.

"Say," said the friend, looking about the sumptuous apartment, "I'll wager they ask plenty for rent here"

"Uh huh," groaned his host. "All the time!"

★ ★ ★

A lot of people are like grain on the verge of going out of condition—proper handling will make them "cool and sweet."

★ ★ ★

Courtesy

A party of sight-seers were being shown a large terminal elevator by the superintendent. One of them pointed to the rows of tanks and asked what they were. The superintendent said, "Tanks." "Oh, you're welcome," smiled the somewhat dizzy visitor.

★ ★ ★

Oh, Oh!

Then there was the superintendent who stopped in a jewelry store to purchase a wristwatch for his wife's birthday.

"So-o-o," beamed the jeweler, "for the wife a surprise, no?"

"I'll tell the world!" grunted Supt. Branbug. "She's expecting a Cadillac!"

★ ★ ★

If you lay around too long you'll probably go sour.

Yo Ho, M' Lads!

It's been rumored, but never substantiated, that while a vessel was loading at a certain house, one of the ship's officers came forth upon the deck and surveyed the scene blearily for some time. Then with a shrug he rolled back into his cabin muttering, "'Shfunny, firsh time I ever loaded at two elevatorsh at onsh!"

★ ★ ★

Tip Off

Said Old Man Dust to Hot Stuff Sparks, "What makes them hate us so?"

Said Hot Stuff Sparks to Old Man Dust, "I guess we gotta go!"

★ ★ ★

Gosh Ding It!

Zeb Pumpkin, of Hayseed County, came upon invitation to the city to see how the terminal elevators did it. He arrived Sunday noon and early the next morning showed up at the elevator where his old time friend, the superintendent, greeted him heartily. But Zeb was indignant.

"E-e-emagine," he gritted. "One of them city slickers tried to sell me the city hall last night — when I bought it that afternoon!"

★ ★ ★

Say - - - - -

Add uses for arsenic: on the fizz-brain who quips, "Hello, Mr. Soy, how've you bean!"

★ ★ ★

A foolish consistency is the hobgoblin of little minds. . . .

Out of the Blower



Tut Tut!

Superintendent Oatclippis appeared as speaker the other evening at a banquet in the De Luxe Hotel. When motioned to, he arose and gave the speech of his life. Imagine his surprise when no one applauded his effort. In a wave of anger he swept from the room and went directly to the manager of the hotel to register his complaint.

The manager expostulated, "But Mr. Oatclippis, I am desolated. Such treatment! Which banquet room is it where zey acted like ze pigs?"

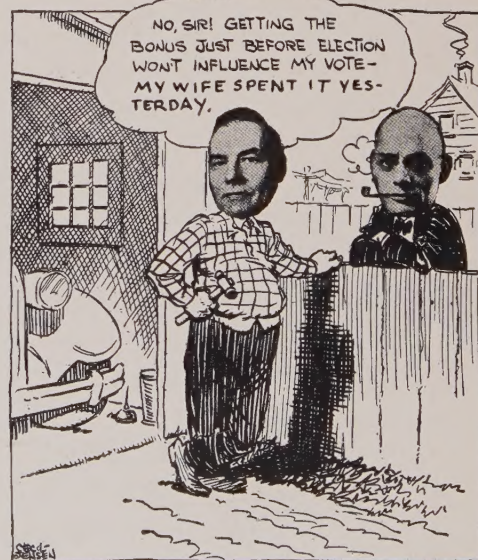
Superintendent Oatclippis answered, "Ze—I mean THE Blue Room."

"Mon Dieu!" shrieked the manager. "Zere is ze mistake! Ze Blue Room holds ze banquet for ze Deaf and Dumb Society!!!"

★ ★ ★

The man who is afraid to face the thoughts of the future is the man who lives for today. Tomorrow, this day will be yesterday . . . and forgotten.

Transferring the Pockets



[Apologies to Chicago Daily News]

Sioux City's H. L. Heinrikson to Chicago's Elmer Karp.

Cancers?



BEFORE

WATERPROOF & RESTORE

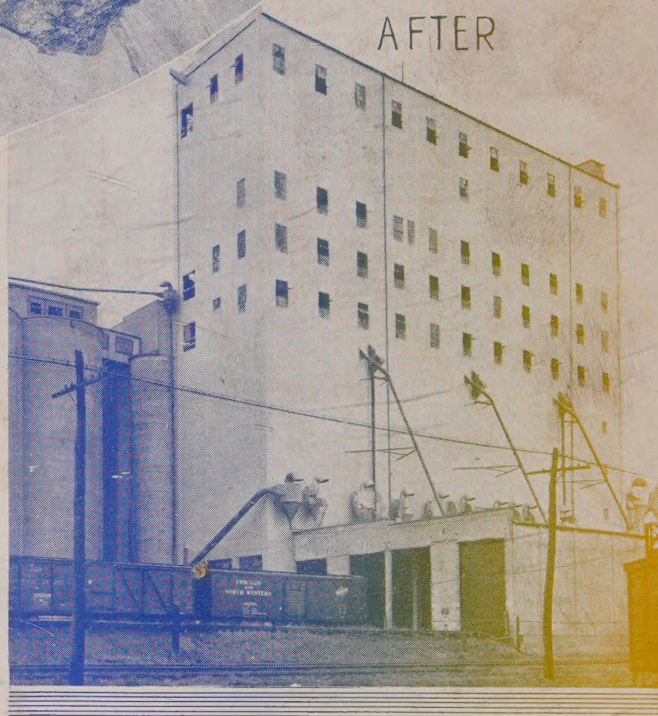
Now!

AVOID HIGHER RESTORATION
COSTS BEFORE IT'S TOO LATE

Estimates CHEERFULLY GIVEN



Chicago & Northwestern Railway's
Kinnickinnic Elevators at Milwaukee,
operated by the Stratton Grain Co.
This is one of a number of grain elevators
that were satisfactorily waterproofed
and repaired by



AFTER

The M. W. KELLOGG CO.

ESTABLISHED 1895

Representative C. L. HANSEN
53 WEST JACKSON BLVD.
CHICAGO, ILLINOIS

References
ANY NEW YORK BANK
DUNN & BRADSTREETS RATING AA-A1
A LONG LIST OF SATISFIED CUSTOMERS

225 BROADWAY
NEW YORK CITY